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Hay fed to appetite along with 5 to 6 lb. of grain is a common ration for growing calves for herd replacements or later feedlot finishing. Feeding could be simplified and costs reduced by feeding grain in the whole form. Studies with corn have often shown some improvement in weight gain and feed efficiency from processing the grain for cattle where the roughage level exceeds about 20% of the dry ration. Sorghum grain, wheat and barley appear to benefit more from processing than does corn grain.

Rations for growing calves often contain 50% or more roughage dry matter. This is a level above which it appears some method of processing should be used for the grain. However, there seems to be less effect from processing grain for calves during the first winter following weaning than for older feedlot cattle.

Hay with a limited feed of oats is a common ration for wintering calves. The oats are commonly ground or rolled. The experiments reported here were conducted to compare whole oats with ground or rolled oats when fed at levels of 5 to 6 lb. per head daily with a full feed of alfalfa as hay or haylage in rations for wintering calves.

Experiment 1

Procedures

One hundred twenty steer calves were purchased for the experiment. They were allotted into 8 pens of 15 each on basis of weight. Those in four pens were fed whole oats and those in the other four pens were fed ground oats. Rations consisted of 5 lb. oats, 1 lb. of supplement and a full feed of alfalfa hay.

The pelleted supplement was composed of ground oats with 6% trace mineral salt, 5% cane molasses and vitamin A to furnish 20,000 IU per pound of supplement. The alfalfa hay was field chopped at 20 to 25% moisture, stacked in 12- to 15-ton stacks and dried by use of ducts and a fan with unheated air. Average protein content on a moisture-free basis was approximately 17.5%.

A hammer mill was used to grind the oats for the group which received this treatment. The oats were ground to pass a 3/8 inch screen so no whole kernels remained. The average protein content was about 15%.

The cattle were fed in outside, unpaved pens without access to shelter. Feeding was once daily with hay offered in about equal amounts to all pens of cattle.

Results

The experiment was started in December and terminated after 203 days. Initial and final weights represent an overnight stand without feed and water.

Daily rate of gain was essentially the same for steers fed whole (1.44 lb.) or ground (1.42 lb.) oats at 5 lb. daily with 1 lb. of supplement and a full feed of chopped alfalfa hay. The hay was fed at approximately the same rate for both groups of cattle. It was offered in excess of consumption, but there was no noticeable difference in amount refused between the two treatment groups of cattle. In this case, feed efficiency was similar for whole and ground oats as was the rate of gain.

A total of seven steers died or were removed during the experiment. Three were fed whole oats and four were fed ground oats. Thus, there appeared to be no difference in grain preparation treatments on these losses. Rations of alfalfa hay and oats as fed in this experiment sometimes present problems from bloat. However, none of the losses were from bloat, and this condition did not present a problem during the experiment.

Experiment 2

Procedures

In view of the excess in feeding hay in experiment 1, it was considered desirable to conduct another experiment where the roughage portion of the ration was fed at levels that would be almost completely consumed. Twenty-six steers were used in the experiment. They were allotted into 4 pens of 6 or 7 per pen on basis of weight. Two pens were fed whole oats and two fed rolled oats at 6 lb. per head daily. Alfalfa-brome haylage (44% dry matter) was full-fed in amounts to be nearly consumed by the next feeding. No supplement was fed to the cattle, but they were offered free access to a calcium-phosphorus supplement and trace mineral salt. The oats were rolled to a fineness so most of the kernels would be cracked.

Feeding during this experiment was once daily in outside, concrete-paved pens without access to shelter.

Results

This experiment was started in mid-December and terminated after 149 days. Initial and final weights represent an overnight stand without feed and water. Results are presented in table 2.

Daily rates of gain were similar for cattle fed whole (1.57 lb.) and rolled oats (1.45 lb.). These rates of gain differ only slightly from the first experiment, also started in mid-December but continued for 203 days. The oat grain was fed at the same level for the whole and rolled groups. Those fed whole oats consumed an average of about 2 lb. more haylage daily (44% dry matter). They had a slightly higher rate of gain, resulting in a similar feed efficiency as for those fed the rolled oats.

No losses occurred during this experiment and no digestive problems were encountered from the oats and alfalfa-bromegrass haylage.

Summary and Comments

Results of two wintering experiments started in mid-December (203 and 149 days) with steer calves showed essentially no difference on basis of weight gain and feed efficiency between oats fed whole and rolled or ground at levels of 5 or 6 lb. daily with a full feed of chopped alfalfa hay or alfalfa-bromegrass haylage. Bloat or other digestive disorders did not present problems during the experiments. Some losses occurred in one experiment, but losses were about the same for whole or ground grain treatments and did not appear to be related to rations fed.

Protein contents of alfalfa and oats are generally in excess of percent protein recommended in rations for growing calves. Thus, any supplement fed could be composed largely of grain. The primary purpose of a supplement would be to serve as a carrier for added minerals, vitamin A and desired feed additives.

Rates of gain obtained from alfalfa hay or haylage and 6 lb. of oats or oats and supplement ranged from 1.42 to 1.57 lb. daily in the two experiments. These rates of gain represent satisfactory ones for growing calves for herd replacements or later feedlot finishing. Feed costs for growing calves with these rations can be calculated from feed requirement data presented in the tables by use of appropriate prices for the feedstuffs. Proper charges should be made for nonfeed costs to arrive at the total costs for the wintering operation.

Table 1. Whole or Ground Oats with Alfalfa Hay for Growing Calves (December 19, 1972 to July 10, 1973--203 days) Experiment 1

	Whole oats	Ground oats
No. animals	57	56
Avg. initial wt., lb.	424	418
Avg. final wt., lb.	716	707
Avg. daily gain, lb.	1.44	1.42
Avg. daily feed, lb.		
Chopped alfalfa hay	15.7	15.6
Oats	5.0	5.0
Supplement	1.0	1.0
Total	21.7	21.6
Feed/100 lb. gain, lb.		
Chopped alfalfa hay	1090	1099
Oats	347	352
Supplement	69	70
Total	1506	1521

Table 2. Whole or Rolled Oats with Alfalfa-brome Haylage for Growing Calves
(December 17, 1975 to May 14, 1976--149 days)
Experiment 2

	Whole oats	Rolled oats
No. animals	13	13
Avg. initial wt., lb.	549	550
Avg. final wt., lb.	784	766
Avg. daily gain, lb.	1.57	1.45
Avg. daily feed, lb.		
Alfalfa-brome haylage	27.33 (13.67)[a]	25.43 (12.72)
Oats	5.92	5.92
Total	33.25 (19.59)	31.35 (18.64)
Feed/100 lb. gain, lb.		
Alfalfa-brome haylage	1733 (871)	1752 (877)
Oats	375	408
Total	2108 (1246)	2160 (1285)

[a]Values in parenthesis corrected to air dry or 88% dry matter basis.